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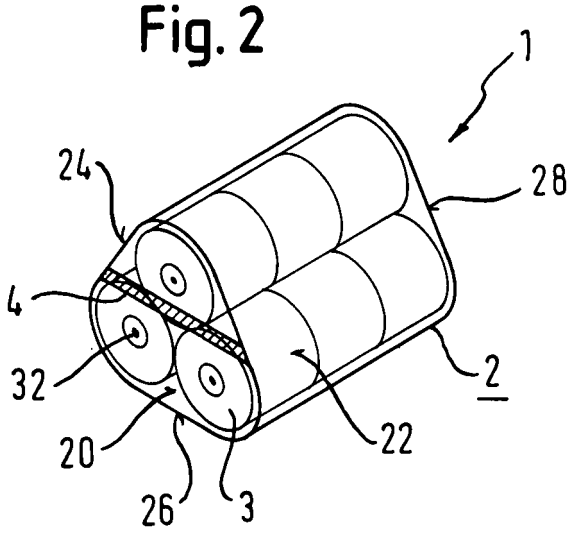
(54) Pack for containing cylindrical hygiene articles

(57) The disclosure relates to a pack (1) for containing at least three cylindrical hygiene articles (3), in particular at least three uncompressed toilet paper rolls, kitchen paper rolls or household towels, the pack (1) comprises a bag (2) having a top side (28) with a single welding seam (40). At least three hygiene articles (3) are arranged in a substantially triangular arrangement in the bag (2), wherein the pack is closed by a second welding seam (4) extending in a plane perpendicular to a winding axis (32) defined by at least one of the cylindrical hygiene articles.

Fig. 2



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Description

[0001] The present invention relates to packs for containing at least three cylindrical hygiene articles, in particular packs for at least three uncompressed toilet paper rolls, household towel rolls, kitchen paper rolls or other tissue paper rolls.

TECHNICAL FIELD AND PRIOR ART

[0002] It is known to fill hygiene products for distribution, presentation and for retailing to the end customer into packs, in particular into flexible packs made from a plastic film material. The packs are usually made such that an appropriate number of hygiene products can be retailed to the customer. For example, rolls of toilet paper are often supplied to the end customer in packs of 1x2, 2x2, 2x5, 2x4, 3x3, 4x3 or 4x5 rolls. However, other configurations for containing up to 25 toilet paper rolls are also widely used. Typically, the rolls are arranged in these packs in single, double or triple layer arrangements such that the respective winding axes of the toilet paper rolls of a layer are situated in the plane defined by the layer and the winding axes are substantially parallel to one another. In other typical packs, the winding axes of the toilet paper rolls of one layer are parallel to one another but extend substantially perpendicular to the plane defined by the layer such that the winding axes represent the nodes of a substantially perpendicular grid.

[0003] Packs of this kind are also known in the field of other hygiene products that are wound onto rolls, in particular kitchen towels and household towels. Due to the greater axial extension of these rolls, the rolls are typically arranged parallel to one another, particularly in single layer or double layer arrangements. In other words, packs of 1x2, 1x3, 1x4, 2x2 or 2x4 kitchen towels or household towels are customary. However, other configurations for containing up to 16 rolls of kitchen towels or household towels are also widely used.

[0004] The packaging material of these packs is usually made of a plastic film material, in particular a substantially transparent plastic film material, on which product designations, trade names, trademark designations, decorations or the like can be printed.

[0005] In the field of developing packs for hygiene articles, many conflicting objectives have to be observed.

[0006] From the logistics point of view, it is important to provide a pack that saves pallet space and, thus, reduces the cost of shipping. In particular for hygiene articles, a large proportion of the volume occupied by the hygiene articles is made up from air as the hygiene articles have a substantially hollow winding core and cannot be stacked too tightly due to their cylindrical form. This is in particular the case when it comes to uncompressed hygiene articles such as toilet paper rolls and kitchen and household paper rolls. Accordingly, new packaging solutions also aim to increase the density of the hygiene articles per shipping volume.

[0007] From a customer point of view, it is desirable that the packs are easy to carry and to handle and have an appealing appearance when being carried in the streets or stored at home.

[0008] From a marketing point of view, it is preferred to have the possibility of imprinting on the pack walls the trade name and customer information such that as large as possible areas are provided which are preferably unwrinkled, enabling a spotless print appearance.

[0009] From a manufacturing costs point of view, it is preferred to use packaging apparatus and packaging material that is already used in the packaging lines and that does not require major restructuring of the packaging lines. Additionally, it is preferred using simple bags having low manufacturing costs.

[0010] All these conflicting issues have to be considered when developing a new pack design.

[0011] GB 2 380 178 A relates to the packaging of rolls of sheet material in which containers are seated in the hollow spaces of the winding rolls, or between the respective rolls. According to this disclosure, the rolls may be wrapped to form a pack.

[0012] US 5,735,106 relates to a continuous process for packaging and compressing products, in particular tissue paper rolls in a cylindrical sleeve.

SUMMARY OF THE INVENTION

[0013] On the basis of the aforementioned prior art and the design constraints mentioned, an object of the present invention is to provide a pack for containing cylindrical hygiene articles resulting in reduced pallet space, reduced manufacturing cost and an improved appearance of the printed faces of the pack.

[0014] According to the present disclosure, the pack for containing at least three cylindrical hygiene articles, in particular at least three uncompressed toilet paper rolls, kitchen paper rolls, household towels or other tissue paper rolls, comprises a bag for containing the hygiene products. Furthermore, the at least three substantially cylindrical hygiene articles are arranged in a substantially triangular arrangement in the bag, wherein the pack is closed by a welding seam extending in a plane substantially perpendicular to a winding axis defined by at least one of the cylindrical hygiene articles.

[0015] The advantage of using a bag for containing the hygiene products is, inter alia, a cost issue. Bags may be produced from a tube-like material by simple welding in the cross-direction of the tube-like material. The processing and packaging lines of the tissue paper manufacturers are usually made for processing these bags such that investments in additional equipment can be basically avoided.

[0016] The arrangement of the at least three basically cylindrical hygiene articles in a substantially triangular form in the bag has more than one beneficial effect. In particular, the space needed on a shipping pallet, e.g. a Euro pallet, is considerably reduced as the cylindrical

objects, namely the toilet paper rolls or kitchen paper rolls, can be packed more densely. This is due to the fact that the respective rolls are situated out of phase with respect to one another. As the cylindrical rolls have a round footprint, a shifting of the rolls with respect to one another, in particular by half of the diameter, leads to a considerable saving of pallet space as the rolls can use the groove between them more efficiently.

[0017] Furthermore, due to the arrangement of at least three hygiene articles in the triangular form, the outer walls of the bag do typically have three faces, or sides, typically of the same size. On these three different faces a print can be applied enabling a brilliant and large-area print application.

[0018] Due to the triangular arrangement and the typically identical size of the individual hygiene articles, an isosceles triangle results, at least in the plane perpendicular to the winding axes of the hygiene articles. In other words, the three faces visible on the outside of the pack have basically the same dimensions. The angle of 60° of the three faces with respect to one another is also beneficial if the packs are placed in a display in a supermarket, as the faces are always be visible from the outside, independent of the orientation in which the pack is placed in a shelf, provided the pack is placed on its bottom or top wall.

[0019] Due to the higher packaging density within the pack, the pack is also easier to carry as it does not have such a long vertical extension, which is particularly advantageous for smaller persons.

[0020] In the description, the term "triangular" with respect to the arrangement of the cylindrical hygiene articles is to be understood such that the winding axes of the hygiene articles are situated such that they constitute the three corners of the triangle. This arrangement is independent of the layer in which the hygiene articles are situated. In particular, it is also understood that a triangular arrangement is present if the winding axes of an arrangement of cylindrical hygiene articles in a first layer in combination with the winding axes of cylindrical hygiene articles of a second layer constitute the corners of a triangle.

[0021] The term "cylindrical" in connection with hygiene articles relates to hygiene articles which are distributed in rollform, in particular toilet paper rolls, household towel rolls or kitchen paper rolls, which may have a basically hollow winding core or, in different embodiments, have no such core at all but are wound fully or are provided as coreless rolls.

[0022] Throughout the description, the term "bag" will be understood to embrace all types of bags. Bags have the character of providing a volume into which the hygiene products can be filled. Bags are typically pre-manufactured by using a tube-like film material, a folded film material or two webs of film material, the respective layers of the film material being joined together on an appropriate number of edges in order to form the bag, leaving open only one single side of the pre-manufactured bag. The term "bag" is, inter alia, in contrast to the term "wrapper" which are provided in the form of a single layer of flat film material which is wrapped around the already arranged hygiene products and is then attached to itself in order to close in the hygiene products.

[0023] It is preferred to use for the film material polypropylene films, polyethylene films, starch based films, biodegradable films and/or material mixtures thereof. A shrink film material may also be used. The packaging material may be provided in the form of different layers of material, in particular as a multi-layer film and/or a laminate.

[0024] The hygiene products that can be contained in the pack include, but are not limited to, toilet paper rolls, kitchen paper rolls, household towel rolls, napkins, facials, hand wiping towels, object wiping rolls and any other suitable hygiene product for personal hygiene or for object wiping and cleaning, as long as it is provided in cylindrical form/roll form. It will be appreciated that also the comparatively big rolls used in public or professional dispensers may be the hygiene products contained in the pack. In a preferred embodiment, the hygiene products themselves are also contained in an individual packaging, in particular in the form of individual rolls wrapped in paper or in a plastic film material.

[0025] In a preferred embodiment, the pack has a handle attached to the tope side of the bag, preferably integrated with the welding seam, or integrated into one of the sides/faces of the bag. The handle is particularly advantageous in carrying the pack easily and has, in the integrated form, the advantage of low manufacturing costs.

[0026] In a preferred arrangement, the winding axes of the cylindrical hygiene articles are arranged such that they substantially constitute the three corners of a triangle, in particular of an isosceles triangle. It might be possible that the winding axes of the cylindrical hygiene articles are situated substantially parallel to one another. By these features, particularly beneficial pack sizes may be obtained.

[0027] In an alternative embodiment, the hygiene articles are arranged in at least two layers, the winding axes of the hygiene articles of the first layer being parallel to the winding axes of the hygiene articles of the second layer. The winding axes of the first layer and the winding axes of the second layer of the hygiene articles are displaced with respect to one another to form at least one triangular arrangement.

[0028] In order to decrease the pack size even further, the hygiene articles are phase-shifted with respect to one another, in particular by half of the diameter of the cylindrical hygiene articles. This specific embodiment enables a close packing as the grooves between the cylindrical hygiene products are filled up with the next layer of hygiene products.

[0029] Preferably, the hygiene articles are arranged in at least two layers, wherein the winding axes of the hygiene articles of each layer are parallel to one another

and are arranged in a triangular form. In this embodiment, another preferred form of a packing arrangement is provided.

[0030] In order to enable easy carrying of the pack, a handle is attached to the bag, wherein the handle extends substantially parallel to the winding axes of the hygiene articles. In an alternative, a handle extends basically orthogonal to the winding axes and intersects with at least one of the winding axes.

[0031] The outer shape of the pack is important for several reasons. First of all, the outer form aids in the provision of printing faces and provides an individual and aesthetic appearance. Second of all, it aids in finding advanced palleting solutions for packing a plurality of packs on a pallet in a space-saving manner. Accordingly, the pack may have the outer form of a prism, in particular a triangular prism. In another embodiment, the pack has the outer form of a wedge. In yet another embodiment, the pack has the outer form of a substantially pyramidal, conical and/or tapering arrangement. For all these outer forms, an exceptionally close packing scheme can be established, leading to a highly efficient packing of the pallets.

[0032] In order to aid the customer in the process of opening the pack, an opening section is preferably provided, which is defined by lines of weakness in the material of the bag, wherein the opening section extends over at least two walls of the pack. The opening section may be opened easily when a handle is provided which extends into the opening section and which constitutes a gripping section, in particular having a finger hole.

[0033] In another embodiment, a separate handle may be attached to the bag, wherein a first section of the handle is attached to the bag in a bottom wall and a second section of the handle is attached to the bag in an opening section such that the second section of the handle can be used for aiding in opening the opening section.

[0034] To be able to re-close the opening section after hygiene articles have been withdrawn, a re-closable tab means may be provided for closing the pack after it has been opened.

[0035] In a further preferred embodiment, the pack is designed for comprising a specially designed opening flap for opening the pack more easily. In this embodiment, a first end section and a second end section of the bag material are overlapped in an overlapping area and a printed area extends into the first end section and/or the second end section in the overlapping area. Furthermore, at least one line of weakness, in particular a perforation, extends into the first end section and/or the second end section substantially within the boundaries of the printed area, wherein the first end section and the second end section are joined to one another in the overlapping area outside the boundaries of the printed area. In the printed area, the overlap is typically not joined such that a gripping section can be provided which can be easily gripped by an end customer. In a preferred embodiment, the overlapping area is situated in at least one of the side walls, preferably extending between two side walls in order to provide an opening flap in the side walls.

[0036] The objective is also solved by a method for manufacturing a pack according to the present disclosure. The method comprises the steps of providing a first layer of hygiene articles by placing at least two columns of hygiene articles next to one another and providing at least a second layer of hygiene articles on top of the first layer of hygiene articles by placing at least one column of hygiene articles in the groove between the two columns of the first layer. In a further step a bag is held open in a substantially triangular form using at least two vacuum grippers which are operated under an angle. The triangular arrangement of the hygiene articles is inserted into the opened bag and the bag is closed by at least two folding blades which are operated under an angle. Then, the folded material is heat welded such that the bag is sealed tightly.

BRIEF DESCRIPTION OF THE FIGURES

[0037] The invention will be described in more detail below with reference to the drawings, in which:

Figure 1 is a schematic plan view on a pack according to a first embodiment, showing the bottom of the pack;

Figure 2 is a schematic perspective view of the pack according to a first embodiment, containing nine toilet paper rolls;

Figure 3 is a schematic perspective view of another embodiment of a pack having a handle in a side face of the pack;

Figure 4 is another schematic perspective view of a pack with a handle on the top wall of the pack;

Figure 5 is a perspective schematic view of a pack substantially in a pyramid form;

Figure 6 is another schematic perspective view of a pack containing three rolls, having a handle and a specific opening mechanism;

Figure 7 is yet another schematic perspective view of an embodiment of a pack for five toilet paper rolls;

Figure 8 is another perspective schematic view of a pack, substantially in pyramid form;

Figure 9 is another pack containing nine toilet paper rolls having a handle and a specific opening mechanism;

Figure 10 is another perspective schematic view of a pack having two handles wherein one of the han-

dles aids in opening the pack;

Figures 11 to 14 show different arrangements of toilet paper rolls in accordance with the present invention;

Figure 15 relates to a pack for kitchen paper rolls during the manufacturing process, wherein the bag is not yet closed;

Figure 16 is another schematic perspective view of a pack having an alternative opening mechanism;

Figure 17 is a schematic view of a section of an alternative opening mechanism;

Figure 18 is a schematic view of a mechanism for folding excessive material of the bag to the center of the bottom face during manufacturing;

Figure 19 is a schematic view of the heat sealing arrangement for closing the pack;

Figure 20 is a schematic view of the opening mechanism used for holding open the bag for filling in the hygiene articles; and

Figure 21 is a schematic view of a tubular material and of a bag having a welding seam.

DETAILED DESCRIPTION OF THE FIGURES

[0038] Figure 1 shows a pack 1 according to the present disclosure in a schematic view plan view from the bottom of the pack. In other words, the bottom wall 20 of the pack 1 is shown.

[0039] The pack 1 is comprised of a bag 2 for containing the hygiene products 3, wherein the bag 2 is made from a polyethylene material. The bag 2 shown in the Figure is a so-called flat bag, meaning that it is basically manufactured from a tube-like plastics foil material which carries a seal in the cross direction to seal together both layers of the tube in order to close a top part 28 of the flat bag. The bottom wall 20 shown in Figure 1, however, is the wall that sits in the position through which the hygiene articles 3 are introduced into the bag 2 before it is sealed off at a welding seam 4.

[0040] The welding seam 4 extends in a plane substantially perpendicular to the winding axes 32 of the cylindrical hygiene products 3. This welding seam 4 is situated in this plane such that a bag 2 can be used for manufacturing the pack 1.

[0041] The hygiene articles 3 are arranged basically in a triangular arrangement, as can be seen in Figure 1.

[0042] By the term "triangular arrangement", the following is understood: the winding axes 32 of the toilet paper rolls are situated in the center of the toilet paper rolls, virtually within the winding cores 30. The winding axes 32 of the toilet paper rolls 3 are, in the embodiment shown in Figure 1, in a parallel arrangement. Furthermore, the three winding axes 32 of the toilet paper rolls 3 are arranged such that they constitute the corners of an triangle, in particular of an isosceles triangle.

[0043] It will be appreciated that the bag 2 used may also be a different type of bag, in particular a cylindrical bag, a bottom folding bag, a side folding bag, a shrink film bag or any other suitable type of bag. It will be understood that in all types of bags the top part is the closed part that is pre-manufactured and that has the specific forms.

[0044] Even though reference is made to a "top side" and a "bottom wall" of the bag in the disclosure, it is to be understood that the terms "top" and "bottom" are not considered limiting and any other combination of walls can be used, provided that a the first side is a pre-sealed side of the bag and the second wall is sealed off after the hygiene products are inserted into the bag.

[0045] In alternative embodiments, shown also schematically in Figures 5, 7 and 8 below, a triangular arrangement is also defined by the pyramidal form of the pack. In these arrangements, the base of the packs is wider than the tip, resulting in a pyramidal, or conical, outer form of the packs.

[0046] Returning to Figure 1, the bottom wall 20 of the pack 1 comprises two flaps 202 and 204 which result from the simple form of the bag 2 in its initial form, namely the bag configuration which leads to some excess material that needs to be folded into the center of the bottom wall. In particular, as a bag having no specified extension in a direction perpendicular to the plane of the bag is used and the final shape of the pack 1 is a triangular, or wedge-shaped, pack, the flaps 202 and 204 of bag 2 stand up after filling the bag 2. These flaps 202 and 204 have to be folded into the bottom wall 20 of the pack 1 in order to close the pack. The process of folding in the flaps 202 and 204 will be explained below, in particular with respect Figures 17 and 18. The resulting flaps 202 and 204, do, accordingly, remain on the bottom wall 20 of the pack 1.

[0047] A schematic perspective view of the pack according to Figure 1 is shown in Figure 2. It becomes immediately apparent that the three side walls 22, 24 and 26 have basically the same size, owing to the fact that the three hygiene articles in the form of the toilet paper rolls 3 have the same outer dimensions.

[0048] In the embodiment shown in Figure 2, nine toilet paper rolls are arranged in the triangular form. In other words, the winding axes 32 of the toilet paper rolls 3 are arranged in a triangular form as mentioned above, i.e. the winding axes constitute the three corners of a triangle. However, three toilet paper rolls are basically aligned in a "column" such that the winding axes 32 of the three toilet paper rolls 3 of the respective columns fall substantially together. Accordingly, the three columns of toilet paper rolls 3 are then arranged in a wedge-shaped form according to the triangular arrangement of the winding

axes of the toilet paper rolls 3.

[0049] The top wall 28 of the pack, which is not directly visible in Figure 2 due to the perspective, is the wall that was manufactured before the hygiene articles 3 were inserted into the bag 2. In other words, the top wall 28 carries the single weld that constitutes the bag in the beginning.

[0050] From Figure 2 it can also be seen that in the three side walls (faces) 22, 24 and 26, substantially no folding of the material occurs. Accordingly, on all three side walls 22, 24 and 26 a print can be applied in a relatively undisturbed manner. The print can be indicative of the contents, or serves other marketing purposes.

[0051] Figure 3 shows another embodiment of a pack 1 which is basically identical to the pack shown in Figures 1 and 2 but, additionally, carries a handle 5 situated in one of the side walls, namely in side wall 22. The handle 5 has a finger hole 50 which enables the end consumer to carry the pack 1 conveniently.

[0052] Figure 4 shows yet another embodiment of the pack 1 which has also a basically identical outer shape as that shown in Figures 1 and 2, but a handle 5 with a finger hole 50 is applied to the top wall 28. The handle 5 and the top wall 28 can be manufactured during the manufacture of the bag 2 itself, before the hygiene articles 3 are filled into the bag.

[0053] The packs shown in Figures 2 to 4 have in common that the outer shape of the bag, even though it was a bag before the hygiene articles 3 are filled into the bag, has now, after the hygiene articles 3 are placed into the bag 2, a wedge-shaped or prism-shaped outer form.

[0054] The terms "wedge" and "prism" are understood in this connection to mean that the top wall 28 and the bottom wall 20 have both a substantially triangular shape and the side walls 22, 24 and 26 extend between a translation of these two triangles basically in a plane.

[0055] Wedge-shaped and prism-shaped does not imply necessarily that the corners of the respective triangles are sharp. In fact, the corners are rather rounded due to the cylindrical form of the hygiene articles 3. It will be appreciated, however, that even though there are no sharp corners, the overall appearance of the top wall 28 as well as the bottom wall 20 is triangular.

[0056] Figure 5 shows another pack 1 having four hygiene articles 3 enclosed therein.

[0057] Here, the arrangement of the hygiene articles in the form of the toilet paper rolls 3 is such that the lower layer of the hygiene articles is arranged such that the winding axes 32 of the hygiene articles are parallel to one another and constitute the three points of a triangle.

[0058] In the second layer, a single toilet paper roll is placed on top of the bottom layer such that the winding axis 32 of the second layer toilet paper roll 3 is exactly placed in the middle of the three winding axes of the lower layer.

[0059] As can be seen in Figure 5, the pack results in a rather pyramidal-shaped form. This form implies that the base of the pack is wider than the top/tip. A handle 5 is placed on top of the pack.

[0060] Furthermore, an opening section 6 is provided and defined by a perforation line 60 around the opening section 6. The opening section 6 enables the end customer to open the pack 1 easily and at a defined position of the pack.

[0061] As may be appreciated, the arrangement of the different toilet paper rolls 3 according to Figure 5 is such that they are all phase-shifted with respect to one another. In other words, the four toilet paper rolls 3 are arranged such that they take up as little volume as possible.

[0062] Figure 6 shows another pack 1 for containing three toilet paper rolls 3. Here, again, the winding axes 32 of the individual toilet paper rolls 3 are arranged parallel to one another and constitute a triangle. The bag 2 is basically made in the same manner as that shown in Figures 1 to 4 and it can be imagined that the pack according to Figure 6 is basically a slice of the bags shown in Figures 2 to 4.

[0063] In the embodiment shown in Figure 6, a handle 5 is provided in one of the corners of the pack. Furthermore, an opening section 6 defined by a perforation 60 is also present. The perforation 60 extends into the handle 5, constituting a gripping section 62 with a finger hole 64, which can be used for opening the opening section 6 by gripping it and ripping the pack apart. A second handle 52 is provided in one of the side walls 22 of the bag 2.

[0064] Figure 7 shows yet another embodiment of a pack 1. According to this embodiment, five hygiene articles in the form of toilet paper rolls 3 are provided in a bag 2. As can be seen from the Figure, the three winding axes 33 are, again, parallel to one another and constitute the outer corners of a triangle. However, in the arrangement shown in Figure 7, the two lower columns of toilet paper rolls 3 include two hygiene articles each, wherein in the top layer only a single hygiene article is present. Accordingly, the pack according to claim 1 has, again, a form resembling that of a pyramid. A first handle 5 is provided in the upper corner, namely the "tip" of the pyramid of the bag 2 and a second handle 52 is provided in one of the side walls 22 of the pack 1.

[0065] Figure 8 shows yet another embodiment of a pack 1 including hygiene articles 3. In a first layer, four hygiene articles 3 are situated and in the second layer, two hygiene articles are situated. The winding axes 33 of all hygiene articles are parallel to one another. However, the four hygiene articles in the lower layer are situated such that the four winding axes 32 constitute the corners of a parallelogram. Furthermore, three of the hygiene articles of the lower layers each constitute with their winding axes 32 the triangle typical for the packs. In other words, the four toilet paper rolls 3 in the lower layer are arranged in a "diamond"-shape. A handle 5 is also present on top of the pack 1 and attached to the bag 2.

[0066] Important for all embodiments of the present invention is that the cylindrical hygiene articles, in partic-

ular toilet paper rolls of one layer, are arranged such that they are packed in the closest possible packing. This leads to an arrangement in which the winding axes of each three neighbouring rolls having parallel winding axes constitute the three corners of a triangle. This is in stark contrast to the arrangements usually used for cylindrical hygiene articles, in which the winding axes of the respective cylindrical hygiene articles are either arranged in a single plane (e.g. kitchen paper rolls) or are arranged such that they constitute the nodes of a rectangular grid (e.g. toilet paper rolls). The conventional arrangements result in basically rectangular shapes of the packs. Packs in which deliberately a shifting of the hygiene articles occurs in a direction perpendicular to the winding axis of the hygiene articles, in particular such that the axis of neighbouring hygiene articles are shifted with respect to the remaining by half the diameter of the cylindrical roll, are not known.

[0067] Figure 9 shows another embodiment of the pack 1. Again, nine hygiene articles in the form of toilet paper rolls are included in a bag 2, wherein in this view the top wall 28 is visible. A handle 5 is situated in the top wall 28 as well as an opening section 6 defined by a perforation 60. The perforation extends into the handle, providing a gripping section 62 having a finger hole 64 such that the end customer may, by using the gripping section 62, easily open the opening section 6.

[0068] Figure 10 shows yet another embodiment of a pack 1, this pack containing six hygiene articles, again in a triangular form. An opening section 6 is defined by a perforation 60 in the bag 2. A first carrying handle 5 is provided, which extends from one of the side walls 22 to the other of the side walls 24 and serves to carry the pack 1 in an upright position. A second handle 52 is provided, basically in a plane perpendicular to the plane constituted by the first handle 5, wherein the second handle 52 extends from a first section 520 which is attached to the bottom wall 20 of the pack 1 towards a second section 522, which is attached to the top wall 28 of the pack. The second section 522 is attached to the foil material of the bag 2 in the area of the opening section 6. Accordingly, the second handle 52 can be used as an aid for opening the opening section 6 by pulling the handle 52 such that a force is effected on the opening section 6.

[0069] It is appreciated, however, that also only one of the handles may be used in the pack 1 of this embodiment. In this respect, the second handle 52 is of particular interest as it enables the end customer to carry the pack conveniently by using the handle. If it comes to opening the pack, the end customer may use the second section 522 of the handle 52 to open the pack in the opening section 6 in order to withdraw/remove single hygiene products from the packaging.

[0070] Figures 11 to 14 show different arrangements of toilet paper rolls 3 which are all considered to include triangular arrangements of the cylindrical articles. Figures 12 and 13 have also a triangular outer shape in a plane perpendicular to the winding axes. In Figures 11 and 14, the hygiene articles 3 are arranged in several sections which could be considered to constitute triangles as it is shown schematically in Figure 11, where the three different triangles are indicted by reference numerals I, II and III.

[0071] Figure 15 shows a bag 2 with its bottom end 20 in a position in which the flaps of the bag 2 are not yet completely folded in and sealed by heat welding. Accordingly, the "ears" of the bag 2 are still shown.

[0072] In Figure 16, a pack 1 is shown in a different perspective such that the top wall 28 can be seen, in which a handle 5 is prefabricated. In this pack 1 a specific opening mechanism is provided, resulting in an opening flap 88.

[0073] This opening flap 88 is formed as follows. In the side wall 22 of the bag 2 an overlapping area 8 is provided, constituted by overlapping a first end section 80 and a second end section 82 of the bag material. A printed area 84 extends into the first end section 80. In order to constitute the bag 2, the first end section 80 and the second end section 82 are joined to one another in the overlap, e.g. by heat welding. In the printed area 84, however, joining is prevented by the print such that the first end section 80 and the second end section 82 are not connected to one another within the boundaries of the printed area 84, but are only connected to one another in the sections outside the boundaries of the printed area 84.

[0074] Two lines of weakness are provided, in particular in the form of a perforations 86 which also extend into the first end section 80. The perforations 86 are provided inside the boundaries of the printed area 84.

[0075] The specific opening flap 88 resulting from the above mentioned features can be easily gripped by an end customer in the freely accessible gripping section 800 and can easily ripped open along the lines of weakness, resulting in an opening mechanism which is easy to use and easy to understand.

[0076] Even though the perforations and the printed area are described in this embodiment as extending both into the first end section, it will be understood that any other combination is also possible, in particular providing the printed area such that it extends into the first end section and providing the perforations such that they extend into the second end section, and vice versa, or both can be provided in the second end section.

[0077] In a preferred embodiment, the printed area 84 extends in the overlap 8 only along a specific portion of the overlap, leaving a gripping section 800 of the opening flap 88 unattached, but closing off the pack completely. This embodiment is schematically shown in Figure 17.

[0078] Figure 18 shows schematically a manufacturing process of the pack in which the bag, in which the hygiene articles have been filled in the configuration as described above, now needs to be closed. In particular, the bag 2 shown in Figure 18 was in a position as shown in Figure 15 above, in which the flaps 202 and 204 need to be folded in.

[0079] The flaps 202 and 204 can be folded in by using

folding blades 70, 72 which are brought into contact with the material of the bag 2 and in particular with the flaps 202 and 204. It will be appreciated that the folding blades 70, 72 are advanced to the pack 1 under an angle, in particular under an angle which is basically perpendicular to the orientation of the respective side walls 22, 24. In other words, the folding blades 70, 72 are usually advanced towards the pack in a direction of 60° with respect to the third side face 26 to the pack.

[0080] After the flaps 202, 204 have been folded in by the folding blades 70, 72, the folding blades 70, 72 stay in place and the pack 1 is sealed by means of two sealing blades 74, 76 which are schematically shown in Figure 19. The sealing blades 74, 76 are heated such that a heat welding and, at the same time, a cutting of the bag 2 material occurs and the bag is left over in the closed position.

[0081] Figure 20 shows schematically the opening of the bag 2, which is, as shown in Figure 21, a typical flat bag 2 being constituted of a basically tubular material which is heat welded by a weld 40 on one of its end, leaving a flat pack to be filled.

[0082] As shown in Figure 20, at least two grippers 78 and 79, preferably vacuum grippers, are necessary to open the bag 2 in a substantially triangular form such that the tissue paper rolls in their triangular arrangement can be inserted into the bag.

[0083] It follows, that the following steps are preferably carried out for filing the bag:

- providing a bag 2 and advancing it into a filling and closing station;
- in the filling and closing station, opening up the bag 2 by at least two vacuum grippers 78, 79 which are guided in an angle with respect to one another, in particular 60°, in order to open up the bag 2 in a substantially triangular form;
- providing an arrangement of cylindrical hygiene articles in the triangular form;
- advancing the hygiene articles in their triangular arrangement into the opened bag;
- closing the bag by folding in the remaining material of the bag using folding blades 70, 72, which are guided under an angle with respect to one another, in particular under an angle of 60°;
- heat welding and cutting the access material by the heat welding blades 74, 76.

[0084] The provision of the hygiene articles in a triangular form can be achieved, e.g. by arranging, in a first step, a first layer of two "columns" of hygiene articles next to one another. In a second step, placing the third column of hygiene articles in a second layer on top of the first and second column of the hygiene articles, specifically in the groove between the first and the second column. This packaging method results in the embodiments shown above, e.g. in Figures 1 to 4, 6 and 7, 9 and 10, 15 and 16. Naturally, it is also possible to use another manufacturing method to achieve the specific arrangements.

[0085] While only preferred embodiments have been described in terms of particular variations and illustrative figures, those of ordinary skill in the art will recognize that the invention is not limited to the variations or figures described. In addition, where methods and steps as described above indicate certain events occurring in certain order, those of ordinary skill in the art will recognize that the ordering of certain steps may be modified and that such modifications are in accordance with the variations of the invention. Additionally, certain of the steps may be performed concurrently in a parallel process when possible, as well as performed sequentially as described above. Therefore, it will be understood that various modifications, variations, changes and adaptations will be apparent to those of ordinary skill in the art without departing from the scope of the appended claims and it is the intent that this patent will cover those modifications, variations, changes and adaptations, as well as equivalents to the subject-matter found in the claims.

Claims

1. Pack (1) for containing at least three cylindrical hygiene articles (3), in particular at least three uncompressed toilet paper rolls, kitchen paper rolls, household towels or other tissue paper rolls, the pack (1) comprising:

   - a bag (2) for containing the hygiene articles (3);
   - at least three hygiene articles (3) arranged in a substantially triangular arrangement in the bag (2), wherein the bag is closed by a welding seam (4) substantially extending in a plane perpendicular to a winding axis (32) defined by at least one of the cylindrical hygiene articles.

2. Pack according to claim 1, wherein a handle (5, 52) is attached to the top side (28) of the bag (2), preferably integrated with the welding seam (40), or to one of the sides (22, 24, 26) of the bag.

3. Pack according to claim 1 or 2, wherein the winding axes (32) of the cylindrical hygiene articles (3) are arranged such that the winding axes (32) substantially constitute the three corners of a triangle, in particular of an isosceles triangle.

4. Pack according to any one of the preceding claims, wherein the winding axes (32) of the cylindrical hygiene articles (3) are situated substantially parallel to one another.

5. Pack according to any one of the preceding claims, wherein the hygiene articles (3) are arranged in at least two layers, the winding axes (32) of the hygiene

articles of the first layer being parallel to the winding axes (32) of the hygiene articles of the second layer, the winding axes (32) of the first layer and the winding axes (32) of the second layer of the hygiene articles (3) being displaced with respect to one another to form at least one triangular arrangement.

6. Pack according to any one of the preceding claims, wherein the hygiene articles are substantially phase-shifted with respect to one another, in particular by half of the diameter of the cylindrical hygiene articles (3).

7. Pack according to any one of the preceding claims, wherein the hygiene articles (3) are arranged in at least two layers, wherein the winding axes (32) of the hygiene articles (3) of each layer are parallel to one another and are arranged in a triangular form.

8. Pack according to any one of the preceding claims, wherein a handle (5, 52) is attached to the bag (2), wherein the handle (5, 52) extends substantially parallel to the winding axes (32) of the hygiene articles.

9. Pack according to any one of the preceding claims, wherein a handle (5) extends basically orthogonal to the winding axes (32) and intersects with at least one of the winding axes.

10. Pack according to any one of the preceding claims, wherein the pack has the outer form of a prism, in particular a triangular prism.

11. Pack according to any one of the preceding claims, wherein the pack has the outer form of a wedge.

12. Pack according to any one of the preceding claims, wherein the pack has the outer form of a substantially pyramidal, conical and/or tapering arrangement.

13. Pack according to any one of the preceding claims, wherein an opening section (6) is provided, which is defined by lines of weakness (60) in the material of the bag (2), wherein the opening section extends over at least two walls (22, 28) of the pack.

14. Pack according to any one of the preceding claims, wherein a handle (5) is provided which extends into the opening section (6) constituting a gripping section (62), in particular having a finger hole (64).

15. Pack according to any one of the preceding claims, wherein a handle (52) is attached to the bag, wherein a first section (520) of the handle (52) is attached to the bag (2) in a bottom wall (20) and a second section (522) of the handle (52) is attached to the bag in an opening section (6) such that the second section (522) can be used for aiding in opening the opening section (6).

16. Pack according to any one of the preceding claims, wherein a re-closable tab, in particular a re-closable stripe of adhesive material or a re-closable stripe of mechanically re-closable material, such as Velcro, a button, a snap fastener or a zipper is provided in order to re-close the bag after opening.

17. Pack according to any one of the preceding claims, wherein the bag is a flat bag (2) having a top side (28) which is closed by a single welding seam (40).

18. Pack according to any one of claims 1 to 16, wherein the bag is a cylindrical bag, a bottom folding bag, a side folding bag and/or a shrink film bag.

19. Pack according to any one of the preceding claims, wherein the bag is made from a sheet material or film material, in particular polypropylene films, polyethylene films, starch based films, biodegradable films, shrinkable films and/or mixtures thereof, and/or a paper material, in particular in the form of different layers of material, in particular as a multilayer film and/or a laminate.

20. Pack according to any one of the preceding claims, wherein the hygiene products include toilet paper rolls, kitchen paper rolls, household towel rolls, napkins, facials, hand wiping towels, object wiping rolls and any other suitable hygiene products for personal hygiene, for object wiping and/or cleaning purposes as long as they are distributed in cylindrical form.

21. Pack according to any one of the preceding claims, further comprising for constituting an opening flap (88):

- a first end section (80) and a second end section (82) of bag material which overlap each other in an overlapping area (8);
- a printed area (84) extending in the overlapping area (8) into the first end section (80) and/or the second end section (82);
- at least one line of weakness (86), in particular a perforation, extending into the first end section (80) and/or the second end section (82) substantially within the boundaries of the printed area (84);
- wherein the first end section (80) and the second end section (82) are joined to one another in the overlapping area (8) outside the boundaries of the printed area (84).

22. Pack according to claim 21, wherein the overlapping area is situated in at least one of the side walls (22, 24, 26), preferably extending between two side walls.

23. Method for manufacturing a pack according to any one of the preceding claims, the method comprising the steps of:

- providing a first layer of hygiene articles (3) by placing at least two columns of hygiene articles next to one another;
- providing at least a second layer of hygiene articles on top of the first layer of hygiene articles by placing at least one column of hygiene articles in the groove between the two columns of the first layer;
- holding open a bag (2) in a substantially triangular form using at least two vacuum grippers (78, 79) which are operated under an angle;
- inserting the arrangement of hygiene articles into the opened bag;
- closing the bag by at least two folding blades (70, 72) which are operated under an angle;
- heat welding the folded material such that the bag is sealed tightly.

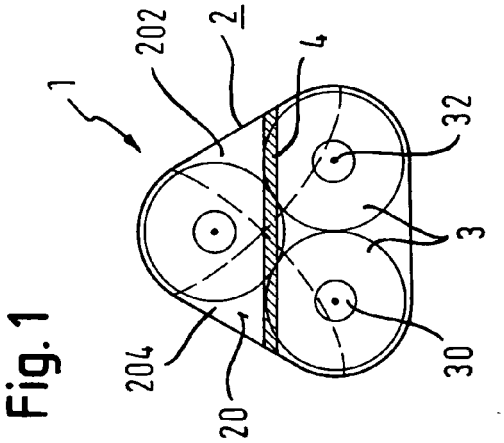


Fig. 1

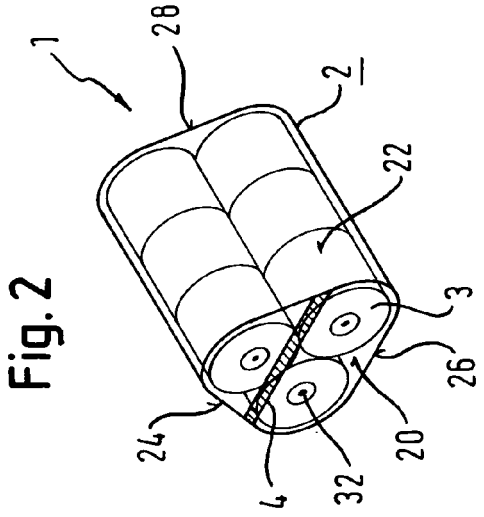


Fig. 2

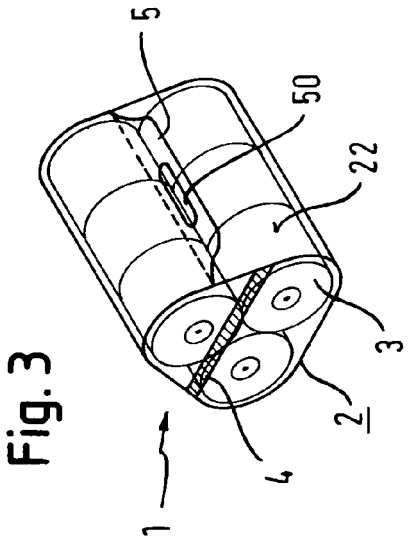


Fig. 3

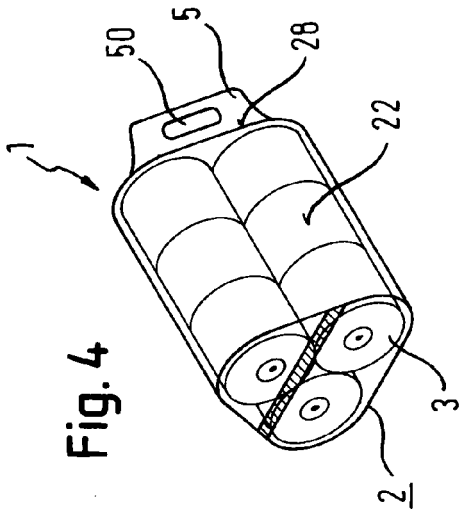


Fig. 4

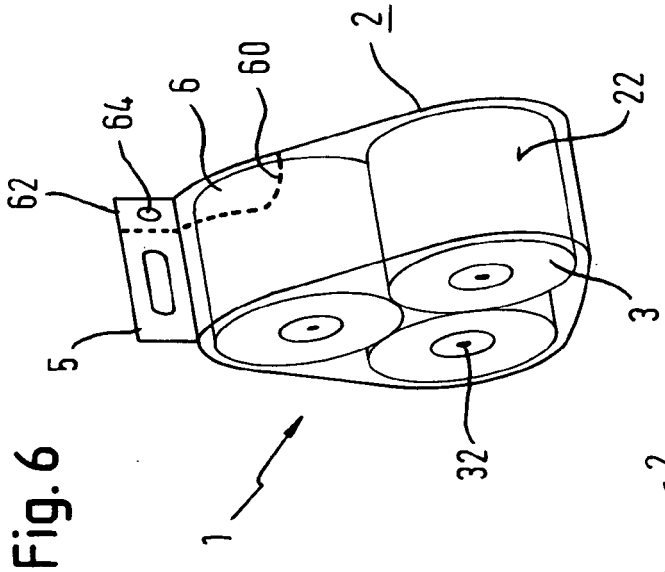


Fig. 6

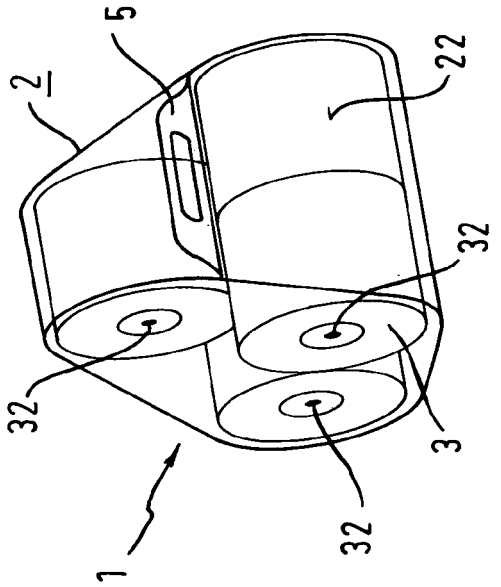


Fig. 7

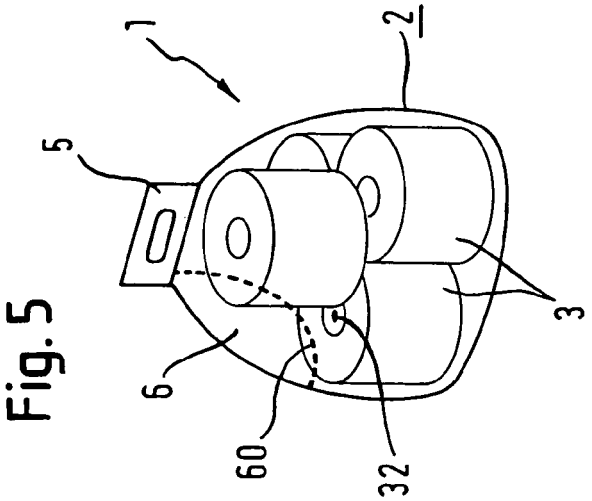


Fig. 5

Fig. 10

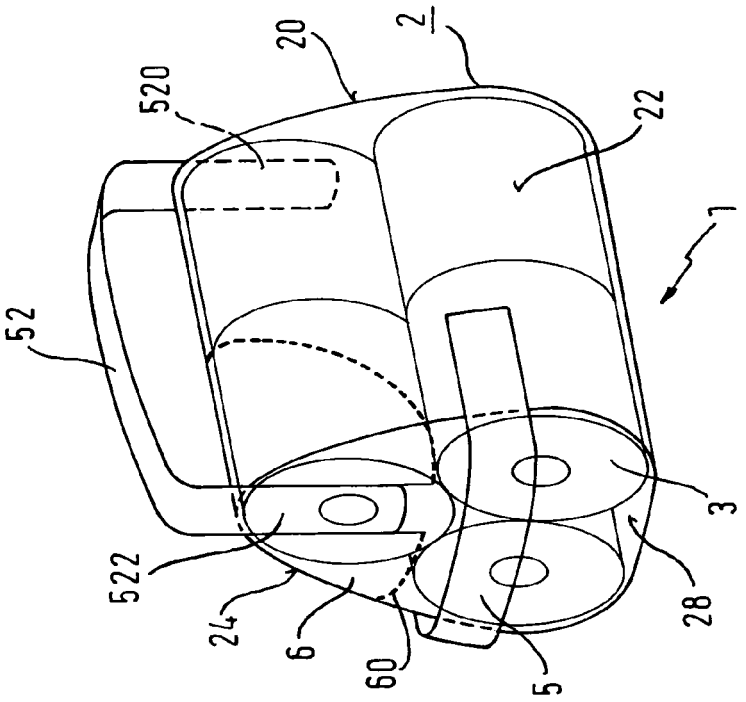


Fig. 9

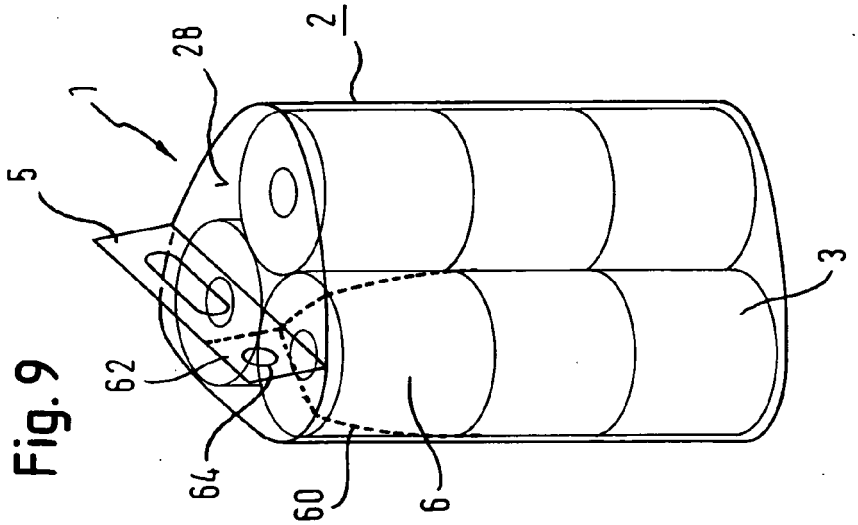


Fig. 8

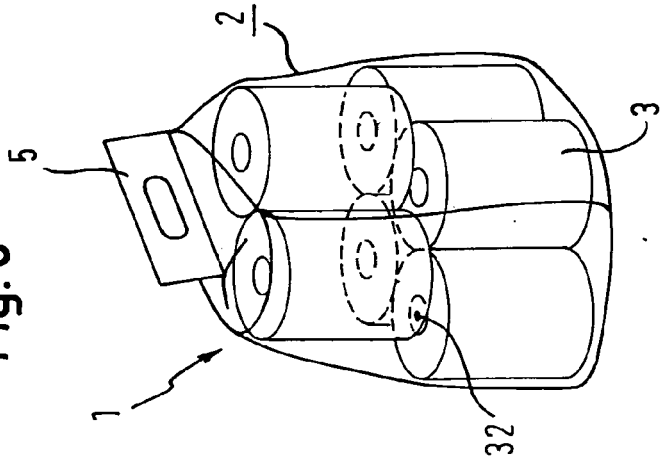


Fig. 15

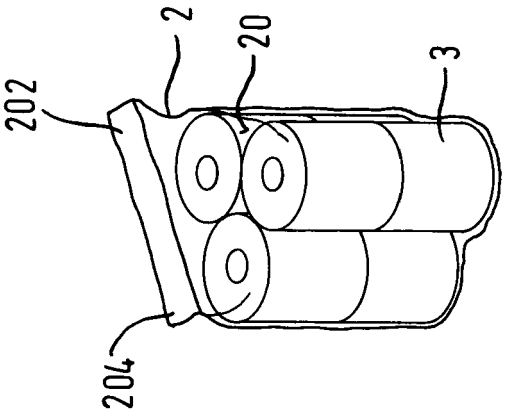


Fig. 12

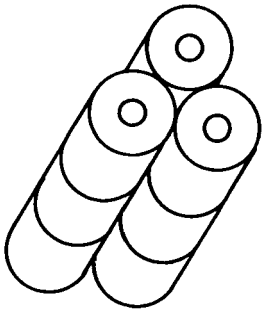


Fig. 15

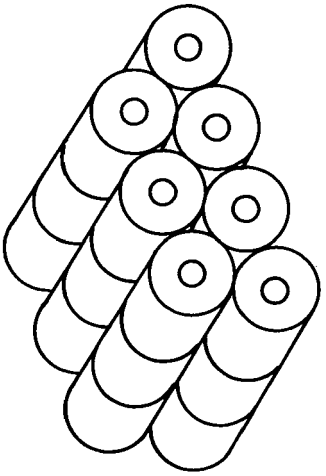


Fig. 11

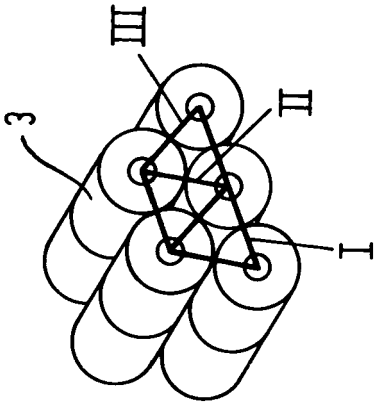
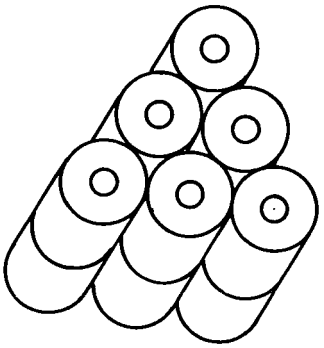


Fig. 13



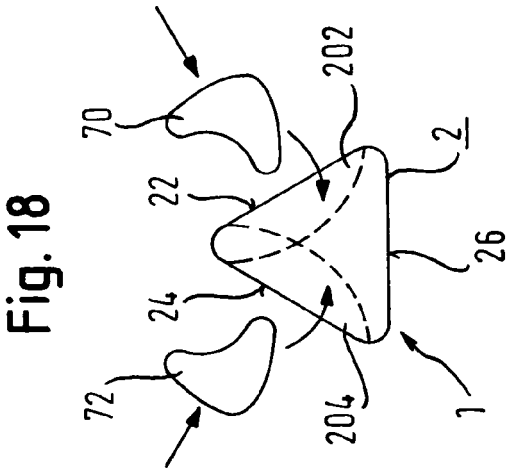


Fig. 18

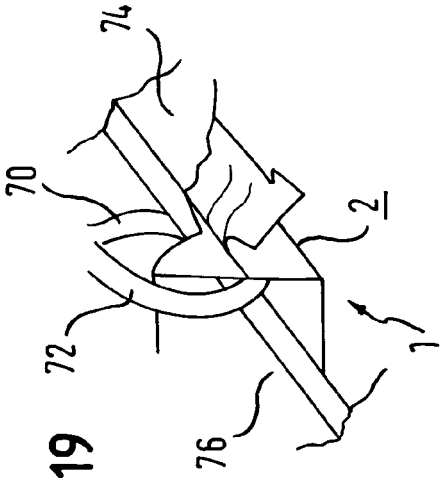


Fig. 19

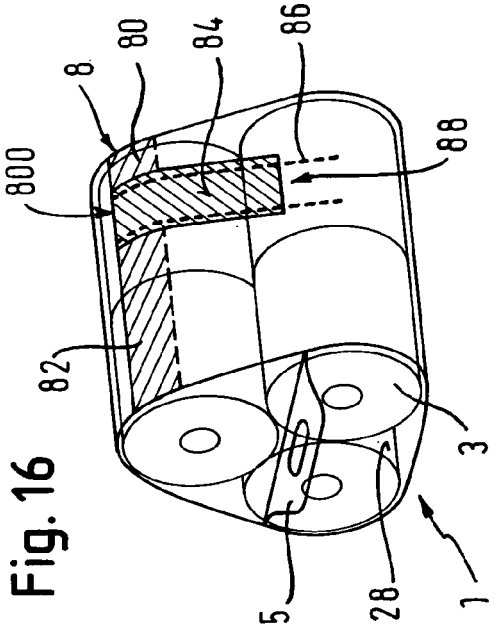


Fig. 16

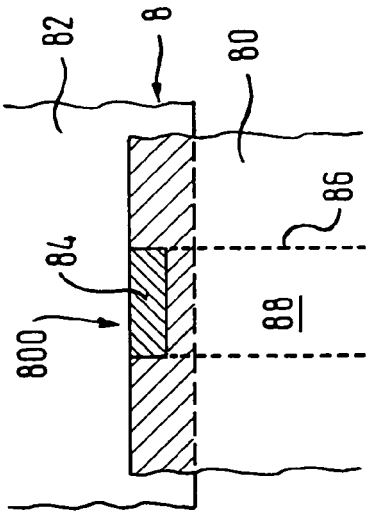


Fig. 17

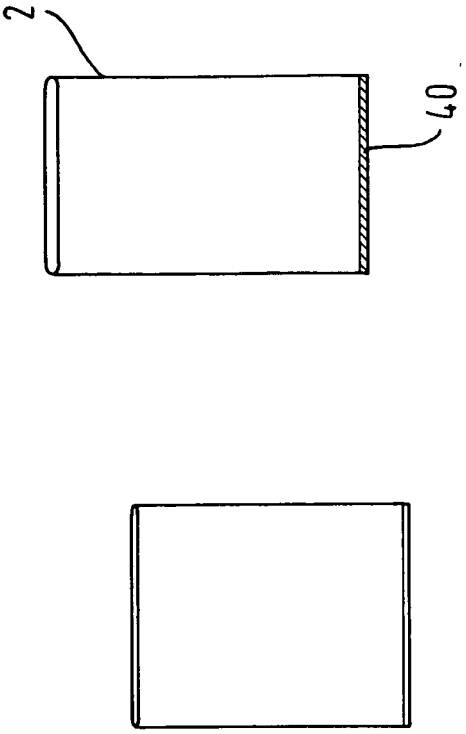


Fig. 21

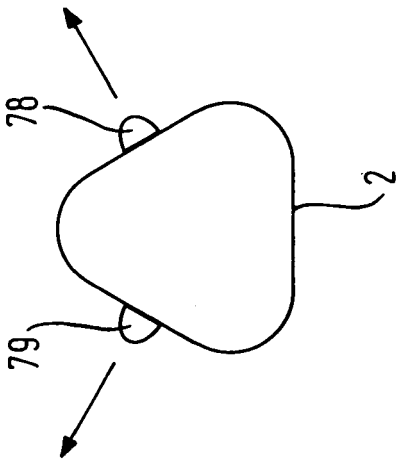


Fig. 20

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 01 4285

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	* column 2, line 30 - column 3, line 16; claims 1-4; figures 1-7 *	23	B65D85/672
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	28 November 2007	Janosch, Joachim

CATEGORY OF CITED DOCUMENTS

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